rarispinus, plate 23, fig. 1, area I. This is an external sandstone mold of the ventral side seen from above, and is therefore reversed, as is your specimen of *Pholidocidaris anceps* seen from within.

"I found in the great preponderance of cases in Palæozoic Echini that odd-numbered columns, while starting in the centre, passed upwards to the left of the centre. On the other hand, even-numbered columns usually start on the right of the centre and maintain that position throughout their extent. Such being the case, I feel that such is the probable course in any given specimen until it proves itself exceptional.

"This internal and external view business and molds of exterior and interior seen in reverse are the most confusing things to keep true orientation straight in that I ever tackled."

XXXVI.—*Fossil Arthropods in the British Museum.*—I.

By T. D. A. Cockerell, University of Colorado.

The British Eocene insects hitherto described consist of three species of Coleoptera, one of Isoptera, and one of Odonata. The two latter, published in recent years, are in the British Museum. Dr. F. A. Bather has kindly transmitted to me the undescribed Eocene material belonging to the Museum, and included with it I find the type-specimens of two of the already-named Coleoptera. These were figured by Westwood in 1854, without names; in 1856 names were supplied by Giebel.

In the present paper I complete the account of the Eocene material, aside from the Coleoptera, which will be discussed separately. Six species are described, more than doubling the list, and adding three orders. The ants are the oldest Old-World species. The Fulgorid represents a type of broad-winged moth-like Homoptera, well developed to-day in the Oriental region, but especially prominent in the Eocene fauna of the Rocky Mountains, as I shall show in a paper now awaiting publication. So far as can be seen, the English insect belongs to one of the American genera. The most remarkable find, however, is a large wing belonging to the Mesozoic family Pseudosiricidæ. Its discovery is almost as startling as that of a Tertiary dinosaur; but after careful study I cannot separate the species from the Mesozoic group, and, indeed, it is very close to the genus *Formicium*.

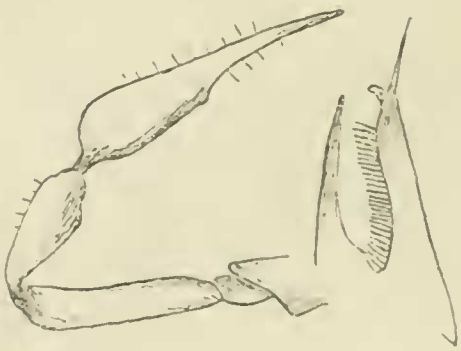
The specimens in Burmese amber (burmite) are also of Tertiary age, and were sent by Mr. R. C. J. Swinhoe, of Mandalay, who kindly presents them to the British Museum. The character and age of the beds has been discussed in earlier papers, particularly Amer. Journ. Science, Aug. 1916, p. 135.

PSEUDOSCORPIONIDA.

Garypus burmiticus, sp. n. (Fig. 1.)

Legs and pedipalpi intense black; apparently no trochantins. Pedipalp with coxa elongated, produced apically; femur ordinary, rather stout, about 450 μ long; tibia about 350 μ long, very stout, obtusely angulate on inner side; hand long (about 800 μ), with a narrow neck, followed by a broad

Fig. 1.



Garypus burmiticus, Ckll.

base which tapers gradually to the apex, the outer margin beyond the basal curve being practically straight; the pedipalp has very few hairs, longest on the hand. Jaw with a long serrula, not detached apically; no flagellum; stylet present.

Burmese amber, from R. C. J. Swinhoe.

Represented by a cast skin, about 6 mm., from the type of *Epyris atavellus*. The serrula, shown in the figure, is about 70 μ long.

I concluded that this could go in *Garypus*, and, sending a copy of my figures to Dr. N. Banks, am informed by him that, so far as these go, there is no reason for objecting to the reference. Among the species of Baltic amber there is a resemblance in the pedipalp to *Obisium rathkii*, Koch and Berendt, though in our *Garypus* the hand is conspicuously more attenuate.

INSECTA.

Orthoptera.

Pycnoscelus (?) *gardneri*, sp. n. (Blattidæ).

Tegmen about 30 mm. long and 12 broad ; marginal field broad, with elevated and broadly rounded base, the width (depth) of the field near base 3 mm. ; subcosta and branches of radius very oblique ; subcosta running parallel with first branch of radius (its total length from base of tegmen 12·7 mm.), giving off a branch about 4·2 mm. from end, and another, rudimentary, one about 1·5 mm. earlier ; radius with very numerous superior branches, first simple, second and third with long forks, fourth with short fork, fifth with two long branches, sixth and seventh each with a long fork, the forked branches with long stems ; radial sector arising about 11·5 mm. from base of tegmen ; media and cubitus between them with about nine principal branches, between which are conspicuous supplementary veins ; cross-veins present. The inferior basal area of tegmen is lost.

Bagshot Beds, Bournemouth (*J. S. Gardner*). British Museum, In. 19030.

This agrees with the modern *Pycnoscelus surinamensis* (L.) in the broad marginal field, general size of tegmen, two-branched subcosta, general character of branches of radius, early origin of radial sector, and numerous branches of media, with supplementary veins between. There are no visible differences which could possibly be regarded as of generic value ; but as we have only an incomplete tegmen, the generic reference must be considered provisional. The amber Blattidæ are very different.

Allopterites (gen. nov.) *multilineatus*, sp. n. (Gryllidæ).

Lower wing as preserved 19 mm. long, but probable total length about 23 mm.

Costa nearly straight ; subcosta, radius, and media running parallel below it, the intervals between them less than the width of the veins ; media giving off very numerous (many more than in *Gryllus*) oblique branches, which are directed toward the apex of the wing ; all these veins are ferruginous as preserved, and the branches of the media are obliquely crossed by numerous (four in 2 mm.) continuous veins of the same colour, directed upward and outward (like the cross-veins in *Mantoida*), forming angles of about 45° with the branches. These oblique cross-veins abruptly cease at the lowest branch

of media, and do not pass on to the cubitus. There are six or more anals close together at base, as in *Gryllus*.

Bagshot Beds, Bournemouth (*J. S. Gardner*). British Museum, In. 19032.

This singular but imperfect wing certainly appears to belong to the Gryllidæ, not very far from *Gryllus*, but it will easily be known by the peculiar markings.

Homoptera.

Hammapteryx anglica, sp. n. (Fulgoridæ).

Anterior wing about 15 mm. long and 7 broad, without markings.

Costa strongly arched, the costal area deep (2 mm. near base), crossed by numerous (about five in 2 mm.) simple veins arising from the subcosta, the first few practically vertical, the others oblique; radius emitting the sector very near (about 2 mm. from) base, as in *Scolypopa*, the sector forking about 3 mm. from its origin; media complex, branching very near base, the upper branch forking 2 mm. beyond level of fork of radial sector, the lower branch forking at same level as fork of radial sector, and the lower division of this again forking. The radius follows a straight course until it reaches the apical third of wing, when it is deflected downward. In the apical third of wing the parallel veins are extremely numerous, about eight in 2 mm.

Bagshot Beds, Bournemouth (*J. S. Gardner*). British Museum, I. 15030.

Differs from typical *Hammapteryx* (North American Eocene) by the broader costal area, but appears to be congeneric.

In. 19031, from the same locality and collector, appears to be the same species, but is too imperfect for positive identification.

Hymenoptera.

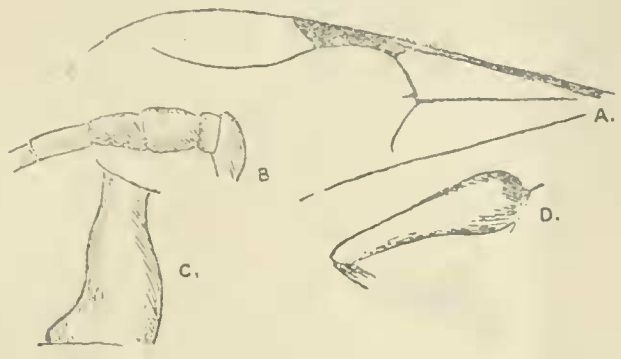
Epyris atavellus, sp. n. (Bethylidæ). (Fig. 2.)

♂.—Length a little over 3 mm.

Black, with the legs dark reddish fuscous. Head oblong, longer than broad; antennæ 13-jointed, extending beyond tegulæ, thick basally, more slender in middle, but broad though flattened apically; second antennæ joint very short, 50 μ long, third 130 μ long. Prothorax very long, distance from tegulæ to base of head almost or quite equal to length of head; thorax not robust, metathorax long. Wings hyaline,

stigma and nervures reddish, the stigma dark; marginal cell open at end, discoidal nervure represented by a stump. Anterior and middle legs ordinary, but hind femora strongly swollen basally. Abdomen fusiform, not very long.

Fig. 2.



Epyris atavellus, sp. n.

A. Anterior wing. B. Base of antenna. C. Prothorax. D. Hind femur.

Burmese amber, from R. C. J. Swinhoe. In a large slab, 10 mm. from outer margin of obtuse corner of broader end.

This appears to belong to that group of *Epyris* which has sometimes been referred to *Mesitius*, but it is a smaller insect, with much longer prothorax, than *E. deletus*, Brues, from the Florissant Miocene. *Epyris*, taken in the broader sense, is a very large genus, still abundant in most parts of the world, especially in tropical regions. The larvæ are parasitic on Coleoptera.

Œcophylla bartoniana, sp. n. (Formicidæ).

Anterior wing 12·3 mm. long.

Marginal cell very narrow; lower section of basal nervure longest; submarginal cell with its apical angle about a right angle. The following measurements are in μ:—Upper section of basal nervure 640; lower section of basal nervure 800; lower end of basal nervure to transverso-medial 1200; greatest depth of submarginal cell 1250.

Bagshot Beds (Bartonian), Bournemouth (*J. S. Gardner*). British Museum, In. 19036.

Very closely allied to *Œ. perdita*, Ckll., from the Oligocene at Gurnet Bay, but the transverso-medial nervure is much nearer the basal.

Formica heteroptera, sp. n. (Formicidæ).

Anterior wing about 13·5 mm. long; submarginal cell 2 mm. Marginal cell extremely narrow, formed as in *Colobopsis stricta* (Jerdon); submarginal cell small and narrow; discoidal cell quadrate, higher than long. The following measurements are in μ:—Width (depth) of marginal cell 352; upper portion of basal nervure 480; lower section of basal nervure (which is arched, and not in a straight line with upper portion) 960; discoidal cell on submarginal about 560; lower end of basal to transverso-medial 1120; greatest depth of submarginal cell (at level of end of discoidal) about 800. The terminal section of the medius is strongly arched.

Bagshot Beds, Bournemouth (*J. S. Gardner*). British Museum, In. 19035. The reverse is labelled In. 18587, and should come from Creech according to the accompanying list, but this is evidently an error.

This is a very singular species, combining the characters of *Colobopsis* and *Formica*, but in some respects different from both. When better known it may prove referable to a distinct genus. I do not know the venation of the genus *Glaphyromyrmex*, Wheeler, from Baltic amber.

Megapterites (gen. nov.) *mirabilis*, sp. n. (Pseudosiricidæ). (Fig. 3.)

So far as the anterior wing shows, the genus is similar to *Formicium*, Westwood, but the first marginal cell is much

Fig. 3.

Megapterites mirabilis.

higher than long, much narrowed above, bell-shaped; the anterior and posterior sides of second discoidal cell are not nearly parallel; the transverso-medial has its lower end a little basad of the upper (compare *Teredon*); the vein M_2 leaves second discoidal cell near the lower end of its outer side, and is distinctly arched, as in many ants. The second

submarginal cell is very long and narrow, and the marginal cell appears to be open, as in all Pseudosiricidæ.

Length of wing as preserved 45 mm., probable total length at least 50 mm.

Basal nervure falling just short of transverso-medial; lower section of basal nervure arched, 5 mm. long, forming nearly a right angle with the upper section, as in *Formicium*, the upper section 2 mm. long; first discoidal cell 5 mm. long; second 5·5 mm. on upper side and 8 on lower; second submarginal cell about 6 mm. long and hardly 2 mm. wide; marginal cell about 2·4 mm. wide (deep), the marginal nervure (radial sector) perfectly straight. The cubital nervure diverges from the marginal, so that 10 mm. beyond end of second submarginal cell they are 4·3 mm. apart.

Bagshot Beds, Bournemouth (*J. S. Gardner*). British Museum, I. 2596, with reverse.

Related to *Formicium*, Westwood, from the Lower Purbeck at Durdlestone Bay. Handlirsch treats *Formicium* as a synonym of *Pseudosirex*, but it is clearly a distinct genus.

XXXVII.—*A new Three-toed Jerboa from China.*

By Arthur de Carle Sowerby, F.Z.S., F.R.G.S.

In a collection of mammals presented by Mr. J. D. de La Touche to the British Museum are two specimens of a three-toed jerboa belonging to the genus *Dipus*, which were collected by Mr. A. L. Hall at Chih-feng in North-eastern Chihli on or near the Mongolian border. They represent a form closely related to *Dipus sowerbyi*, originally described by Mr. Oldfield Thomas * from specimens collected by myself in the Yu-lin-fu district on the border of the Ordos Desert, some 500 miles to the south-west of Chih-feng; but since they present differences in cranial and body measurements, as well as a slight variation in colour, and having regard to their geographical distribution, they may be considered as belonging to a distinct species, which, in view of the fact that he was the original collector, I propose to name after Mr. Hall:—

Dipus halli, sp. n.

In size this new species is somewhat larger than *D. sowerbyi*, which in turn was described as being larger than

* Ann. & Mag. Nat. Hist. ser. 8, vol. ii. (Sept. 1908).